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(54) Title: **CHLORINATED POLYOLEFINS AND PROCESS FOR THEIR PRODUCTION**

(57) Abstract: Uniform chlorinated polyolefins which can give crosslinked rubbers and thermoplastic elastomers with excellent low-temperature rubber elasticity, compression set and fatigue strength, and a process for their production. Polyolefin powder pulverized to a mean particle size of no greater than 500 μ is used for chlorination.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C08F8/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 239 457 A (SANYO-KOKUSAKU PULP CO., LTD.) 3 July 1991 (1991-07-03) the whole document ---	1-17
X	AU 490 384 B (STAMICARBON B.V.) 11 March 1976 (1976-03-11) page 15, paragraph 2; claims 1-12 ---	1-17
Y	WO 86 03499 A (THE DOW CHEMICAL COMPANY) 19 June 1986 (1986-06-19) page 3, line 1 -page 5, line 8 page 7, line 23 -page 9, line 5; claims 1-13 ---	1-17
Y	EP 0 103 703 A (THE B.F. GOODRICH COMPANY) 28 March 1984 (1984-03-28) page 3, line 13 -page 4, line 8; claims 1-10 ---	1-17
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PCT/JP 03/11743

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 15 95 194 A (DU PONT DE NEMOURS AND COMPANY) 9 April 1970 (1970-04-09) the whole document ---	1-17
A	EP 0 928 673 A (DAIKIN INDUSTRIES, LTD.) 14 July 1999 (1999-07-14) claims 1-10 ---	1
A	US 3 856 766 A (H. KLUG) 24 December 1974 (1974-12-24) the whole document ---	1
A	EP 0 131 937 A (UCC) 23 January 1985 (1985-01-23) page 3, line 4 -page 4, line 25; claims 1-10 ---	1
A	GB 2 198 136 A (CENTRAL GLASS CO., LTD.) 8 June 1988 (1988-06-08) claims 1-11 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/JP 03/11743

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2239457	A	03-07-1991	JP 1898326 C	23-01-1995
			JP 3199207 A	30-08-1991
			JP 6027131 B	13-04-1994
			DE 4041382 A1	04-07-1991
			US 5180791 A	19-01-1993
AU 490384	B	11-03-1976	AU 490384 B2	11-03-1976
			AU 7295674 A	11-03-1976
WO 8603499	A	19-06-1986	AU 585291 B2	15-06-1989
			AU 5099285 A	01-07-1986
			CA 1259446 A1	12-09-1989
			DE 3584630 D1	12-12-1991
			EP 0204816 A1	17-12-1986
			JP 3077202 B	09-12-1991
			JP 61502766 T	27-11-1986
			KR 9001555 B1	15-03-1990
			WO 8603499 A1	19-06-1986
			US 4767823 A	30-08-1988
EP 103703	A	28-03-1984	US 4473451 A	25-09-1984
			EP 0103703 A2	28-03-1984
			FI 832690 A	29-01-1984
			JP 59041306 A	07-03-1984
DE 1595194	A	09-04-1970	US 3364187 A	16-01-1968
			DE 1595194 A1	09-04-1970
			FR 1462060 A	09-12-1966
			GB 1063555 A	30-03-1967
			NL 6517089 A	01-07-1966
EP 928673	A	14-07-1999	JP 10080917 A	31-03-1998
			DE 69717473 D1	09-01-2003
			DE 69717473 T2	10-07-2003
			EP 0928673 A1	14-07-1999
			CN 1235572 A ,B	17-11-1999
			WO 9809784 A1	12-03-1998
			US 2002099146 A1	25-07-2002
			US 2003208005 A1	06-11-2003
US 3856766	A	24-12-1974	DE 2262536 A1	27-06-1974
			BE 809002 A1	21-06-1974
			CA 1008595 A1	12-04-1977
			FR 2211485 A1	19-07-1974
			GB 1406728 A	17-09-1975
			IL 43833 A	30-09-1976
			IT 1001151 B	20-04-1976
			JP 49090393 A	29-08-1974
			NL 7317184 A	25-06-1974
EP 131937	A	23-01-1985	US 4593075 A	03-06-1986
			AT 38843 T	15-12-1988
			AT 38524 T	15-11-1988
			AU 565211 B2	10-09-1987
			AU 3072884 A	17-01-1985
			AU 562466 B2	11-06-1987
			AU 3072984 A	17-01-1985
			CA 1232398 A1	02-02-1988

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 03/11743

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 131937 A		CA 1246798 A1	13-12-1988
		DE 3475076 D1	15-12-1988
		DE 3475310 D1	29-12-1988
		EP 0131937 A1	23-01-1985
		EP 0131938 A1	23-01-1985
		JP 1494982 C	16-05-1989
		JP 60076509 A	01-05-1985
		JP 63043405 B	30-08-1988
		JP 1545219 C	15-02-1990
		JP 60076505 A	01-05-1985
		JP 63036604 B	21-07-1988
		US 4560731 A	24-12-1985
		ZA 8405447 A	27-03-1985
		ZA 8405448 A	27-03-1985
GB 2198136 A	08-06-1988	JP 1937532 C	09-06-1995
		JP 6067859 B	31-08-1994
		JP 63139139 A	10-06-1988
		DE 3740565 A1	09-06-1988
		FR 2607508 A1	03-06-1988
		IT 1223386 B	19-09-1990
		US 4908415 A	13-03-1990